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THE FIFTH SATELLITE OF *JUPITER*.

Just as the last pages of Number 25 of the *Publications* were going to press we had the pleasure of inserting Professor BARNARD'S original telegram announcing the discovery of a fifth satellite to *Jupiter*. Regarding his search for new objects, and the resulting discovery of the satellite, we shall quote his own account as published in the *Astronomical Journal:*

"Nothing of special importance was encountered until the night of September 9, when, in carefully examining the immediate region of the planet *Jupiter*, I detected an exceedingly small star close to the planet, and near the third satellite. I at once measured the distance and position angle with reference to Satellite III. I then tried to get measures referred to *Jupiter*, but found that one of the wires had got broken out and the other loosened. Before anything further could be done the object disappeared in the glare about *Jupiter*. Though I was positive the object was a new satellite, I had only the one set of measures, which was hardly proof enough for announcement.

"I replaced the wires the next morning. The next night with the great telescope being Professor SCHAEBERLE'S, he very kindly gave the instrument up to me, and I had the pleasure of verifying the discovery, and secured a good set of measures at elongation.

"Just what the magnitude of the satellite is it is at present quite impossible to tell. Taking into consideration its position, however, in the glare of *Jupiter*, it would, perhaps, not be fainter than the thirteenth magnitude."

The recent observations of the satellite give about $11^{h}\ 57^{m}\ 20^{s}.5$ for its period of revolution, and about 112,510 miles for its mean distance from the planet's centre. The plane of its orbit appears to be the common plane of all the satellites, but its orbit is probably more eccentric than those of the other satellites. Its diameter is probably in the neighborhood of 100 miles.

The satellite has been seen and a few observations secured with the 26-inch telescope of the University of Virginia, with the 23-inch telescope of Princeton College, and with the 18-inch at Evanston. Unfortunately, the great equatorial of the Naval Observatory in Washington is dismounted and undergoing removal to the new observatory buildings.

Thus far the satellite does not appear to have been observed with any of the great European telescopes. This is probably on account of the unfortunate fact that the LICK Observatory telegrams were seriously changed during transmission, and the observers were led to expect the satellite at elongation at wrong times. However, it is probable that sufficient observations will have been obtained during the opposition upon which to base a thorough investigation of the orbit. E. S. H.

DR. GILBERT ON THE EVOLUTION OF THE MOON.

[At a meeting of the National Academy of Sciences, held at Baltimore, November, 1892, Dr. G. K. GILBERT, of the U. S. Geological Survey, presented a memoir on the Evolution of the Moon. An abstract of this paper is given in the *American Naturalist* for December, and is reprinted below. In this connection the reader should refer to these *Publications*, Volume IV, p. 37, where an observation of Dr. GILBERT'S on a crater in Arizona is described. This crater was actually formed by a falling meteor. So far as I know, Dr. GILBERT is the first geologist of high standing to give his authority to the hypothesis that lunar craters have, *in general*, been formed by the bombardment of the lunar surface by meteorites. My own studies on Moon photographs do not lead me to the same conclusion. I hope that some of the selenographers of the Society, Messrs. WEINEK, ELGER, RANYARD and others, may be willing to treat this question in the *Publications*.—E. S. H.].

"Dr. GILBERT said in part: 'The surface of the Moon, like that of the Earth, is diversified by plains, uplands and mountains, and these various features have special characters in which they differ from those of the Earth. The plains lie lower than other portions of the surface, and are distinguished by their darker color. By those who have mapped the surface of the Moon they are called seas, but the word is used in a figurative sense, for it is well understood that there is no water on the Moon. The mountains are usually in the form of rings, each ring inclosing a hollow, and to this form the name crater is given. They are scattered over the surface of the plains, and on the uplands they are thickly set, overlapping one another in every variety of relation. They are of all sizes, from the smallest that the telescope can discern to a diameter of several hundred miles. Those of medium and larger size are usually characterized by a smooth circular plain in the interior and a hill or group of hills rising in the center of the plain. They differ from the craters of the Earth in various ways, especially in the fact that their bottoms are below the level of the surrounding country, and in the fact that the central hill bears no crater on its summit.